

Notice of Allowability

Application No.

10/710,786

Examiner

Jennifer M. Dolan

Applicant(s)

HUANG, MIN-LUNG

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amdt. of 9/6/06.
2. ☒ The allowed claim(s) is/are 1-8.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____


CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-8 are allowed.
2. The following is an examiner's statement of reasons for allowance:

The primary reason for allowance is the use of first and second photoresist layers, the first layer having a smaller viscosity than the second layer, over a wafer including either bonding pads, a passivation layer that exposes the bonding pads, and a metal layer that exposes a portion of the passivation layer (claims 1-5) or including a top surface with an exposed portion of a metallic layer and an exposed portion of a non-smooth flat surfaced layer around the metallic layer (claims 6-8), in addition to the other limitations in the claims.

The prior art provides only minimal suggestions of using a two-layer photoresist having a lower viscosity bottom layer, as claimed. The closest prior art of record is JP 10-124826 to Chiyokubo, which teaches use of the two layer resist as claimed, but disposes the resist entirely upon a metal layer. Chiyokubo indicates that the purpose of the low viscosity resist is to completely fill the corners of a via coated by the metal layer, and thus there is no suggestion or motivation for using the two-layer resist of Chiyokubo on the claimed structures. US 2005/0277245 to Ohta et al., similarly teaches use of a two-layer resist with a lower viscosity bottom layer (although the Examiner notes that all combinations of high and low viscosity layers are disclosed in Ohta, with no particular preference toward the lower viscosity bottom layer), but provides no motivation for the use of such a structure on anything other than a non-flat metallic layer.

Although it is expected that the prior art would show deposition of a single photoresist layer on the claimed substrate surfaces, as such methods are notoriously old and well-known in the art, the Examiner asserts that there is insufficient motivation or suggestion in the prior art to combine such a method with the two-layer resist of Chiyokubo or Ohta, and further that that the invention as claimed provides a critical and unexpected result over the prior art of record. The Examiner notes that the use of a low viscosity resist on the surface of a passivation layer or other rough surface eliminates gap formation between the resist and the passivation layer, and thus eliminates solder filling in the gap (see paragraphs 0010 and 0015 of the present Application, for example). Since this advantage deriving from the combination of the claimed rough or passivation surface with a low viscosity resist is well beyond the teachings of the prior art of record, such as Chiyokubo or Ohta, it is the Examiner's opinion that the invention as claimed would not have been obvious to a person having ordinary skill in the art.

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (571) 272-1690. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jennifer M. Dolan
Examiner
Art Unit 2813

jmd